

**Achievement of Market-Friendly Initiatives and Result Program
(AMIR 2.0 Program)**

**Funded by
U.S. Agency for International Development**

Curriculum Development

Final Report

**Deliverable for ICTI Component, Task No. 454.1
Contract No. 278-C-00-02-00210-00**

December 2002

This report was prepared by Sören Törnkvist in collaboration with Chemonics International Inc, prime contractor to the U.S. Agency for International Development for the AMIR Program in Jordan.

Individuals interviewed:

H.E. Dr. Khaled Toukan – Minister of Education
Dr. Tayseer Al-Nhar – National Center for Human Resource Development
Dr. Abu-Haijja – Local consultant for Component 2 preparation
Elizabeth Abraham – Asst. Deputy Minister, New Brunswick
Khalida Shatat, – E-learning Coordination Unit. Ministry of Education
Sana’S. Khair – E-learning Coordination Unit. Ministry of Education
Khitam Al-Utaibi – E-learning Coordination Unit. Ministry of Education
Eng, Hala Taher E-learning Coordination Unit. Ministry of Education
Glenn Murray – E-learning Coordination Unit. Ministry of Education
Ghassan N. Alkoja – Senior Information Officer, The World Bank
Emad Ghattas – Integrated Technology Group
Walid Tahabsem – Integrated Technology Group
Nelson Ireland – AMIR Program

Table of content

Introduction.....	2
1. Computerism.....	2
2. Decentralization.....	3
Production of learning material.....	3
Examinations.....	3
3. The Component 2 document.....	3
Curriculum work.....	3

Appendixes

Appendix 1: Learning outcomes.....	4
Appendix 2: Quality of Education.....	5
Appendix 3: Three Curriculum Principles.....	11
Appendix 5: Component 2- Transformation of the Education Programs and.....	12
Practises to Achieve Learning Outcomes relevant to the Knowledge Industry	

Introduction

The present report describes an attempt to translate the vision of a Market-Friendly Education in Jordan into classroom reality, to answer the question: how can learning best be organized to achieve the desired goals? The answer to such a question is a **Curriculum**, which lays down Why and How certain skills, attitudes and insights such be achieved by the students. Curriculum development is always a balance act between mutually exclusive fundamental values. Unless these values are clearly articulated and weighed against each other the curriculum becomes a mélange of this and that. See appendix 3.

My Scope of Work was to rewrite the component 2 of the MoE ERFKE proposal, the one about the curriculum. Personally I believe that this is the core of the matter and should have been dealt with first, before any deliberations about management, school buildings and computers. It is however understandable that this component had (unconsciously?) been postponed since it is the most value-laden. Thus methods have been suggested to solve problems never clearly articulated. Now I was confronted by a lot of talk about “e-learning”, a word I never heard before. But a recognized the vehemence for a technological solution to a humanistic problem; during the 70’s the Videocassette was supposed to salvage education – with disastrous results.

In this summary I will restrict myself to two central issues: Computerism and Decentralization.

1. Computerism

The Gap Analysis performed by the New Brunswick, Department of Education for the Ministry of Education in October 2002 is one of the many documents which I reviewed. There it is mentioned that:

There is a lack of understanding of the e-learning vision, particularly at the school and community level.

I too fail to understand the concept “e-learning”. To launch a reform based on an idea that is not easily understood seems risky. Thus the question must be addressed: Why this confusion? There appears to be a gap between those who understand the word “e-learning” and those who do not. My interpretation is that this is a gap, which separates the two camps: the Humanists and the Mechanists. The Humanists acknowledge that education is value-laden, and that any curriculum is the result of a compromise between mutually incompatible values. Further, they believe that learning goes on in the head of a student on his/her conditions. The Mechanists hold a simpler view and for them computer mediated learning means an improvement compared to learning by reading or by attending chalk-and-talk session. In addition, the humanists’ views are often based on research about how children learn. Consequently they understand why there is no empirical evidence supporting the use of computers in education. For a more thorough discussion about this issue see Appendix 2.

Thus my first contribution as a later-comer to this project was to infuse some of the current thinking on learning. Three of several occasional papers produced for discussions are here given as appendices together with the final document:

1. Learning outcomes – deep and surface approach
2. Quality of education

3. Three curriculum principles
4. Component 2: Transformation of the Education Programs and Practices to Achieve Learning Outcomes relevant to the Knowledge Industry – with two timetabling sheets.

These papers converge into a plea for a curriculum-driven reform rather than a computer- or a managerial-driven ditto. Whether this plea is going to have any effect is still an open question. I personally remain pessimistic. And find it unfortunate that the justifiable appeal for learning outcomes in tune with the knowledge economy has been watered down to the call for more computers in the schools. There are reasons for pupils/students to learn how to use computers, but it is not through the use of computers that education will be improved.

My visit to the Integrated Technology Group in Amman and my subsequent reading of their supporting document does not alter the above conclusion.

2. Decentralization

Production of learning material

Many suggestions have been made concerning the top-down control in the educational sector, *inter alia* the production of learning material. One would have thought that a desirable task for a Knowledge Economy would be to produce learning material for the schools. But the MoE wants to retain the textbook writing capacity within its own walls. And put the learning material on CDs, which means building an even more definitive – and less amendable track – through the school. For those who believe that knowledge is a personal and provisional construct this is bad news. And it will tie up the teachers even more.

Examinations

It has also been suggested in my final paper (appendix 4.) that teachers should be given more responsibility to perform continuous assessment of the students' achievement that would be counted towards a final mark. This in the light of the fact that centrally organized final paper-and-pen examinations have been shown to be notoriously unreliable. In the ensuing discussions concerning this issue the counter argument submitted was: teachers cannot be relied upon since they deflate the marking system. But mistrust is hardly conducive to a Knowledge Economy. To solve this balance between delegated responsibility and control, seems to an outsider as the real challenge for the educational system of Jordan.

3. The Component 2 document

Curriculum work

The component 2 document (Appendix 4) describes in detail the necessary (if not sufficient) steps to be taken to reform the educational system towards the demands of a knowledge economy. It is of paramount importance that the curriculum work is done under informed guidance from the best curriculum expertise available, and involves as many of the potential stakeholders as possible, in particularly the teachers, without whose full cooperation any curriculum reform is doomed. A detailed plan for how this can be done is part of appendix 4.

Appendix 1

Learning Outcomes

It is obviously important to be able to formulate some sort of desirable outcome of learning. But most attempts have fallen short because knowledge seems to be contextual. What we measure in a school context (i.e. during an examination) is not necessarily the same as a former student of ours will demonstrate neither in non-threatening situation, nor for that matter in an emergency. It has been shown that even such seemingly banal contextual variation as to change the order of the items on a test will affect the outcome. Given all this there is among educators move towards what is called **authentic examination**. Before the emergence of mass education oral examinations were very common. Such examinations could easily be made authentic. But the sheer number of pupils and students to be examined these days makes authenticity difficult. So educators started to use Multiple-choice questions – at least partly – in their examinations. However, the very act of ticking in the right box has been shown to induce what is called a **surface approach** to learning among students, even if the MCQ are well composed. Surface approach is an intentional act, which can be applied for a verity of reasons. A few characteristics of this approach are listed below.

- Focus on “the sign” e.g. the words and sentences of the text, or unthinkingly on the formula needed to solve the problem.
- Focus on unrelated parts of the task.
- Memorise information for assessment
- Associate facts and concepts unreflectively
- Fail to distinguish principles from examples
- Treat the task as an external imposition

The opposite of surface approach is **deep approach**.

The point here is that too much testing – with our without MCQ – can make students employ a surface approach. Obviously we cannot scrap examination totally. But in order to make it **valid and reliable** an enormous amount of work has to be done, in particular if one would like to avoid students develop a surface approach to learning. Testing educational achievement is nowadays almost an industry. Whereas writing learning objectives comprehensible to students (teachers and parents) is difficult, designing mock tests is somewhat easier. Thus work with examination in a situation of educational reform must be ready when the first students will commence their studies.

Appendix 2

Quality of Education

Preamble

...the criterion of the value of school education is the extent in which it creates a desire for continued growth and supplies means for making the desire effective in fact.

The quotation above comes from John Dewey (*Democracy and Education* 1916). It reflects the strong humanistic trend in American educational philosophy, according to which the educational process must 1° begin with and build upon the interests of the child, must 2° provide opportunity for the interplay of thinking and doing in the child's classroom experience, allow 3° the teacher to be a guide and co-worker with the pupils, rather than a taskmaster assigning a fixed set of lessons and recitations; and 4° aim at the growth of the child in all aspects of its being.

Educational Philosophy

This is not the place for lengthy discussions on educational philosophy, but the above quotation serves to illustrate the decisive role that **underlying values** play in any discussion on education, including this one. Our values are products of various personal factors, not of any rational analysis. We might be unaware of them, and unable to articulate them, but they are never the less with us. Much misunderstanding could have been avoided had the people involved been aware of their own – and other's – underlying values. If we do not acknowledge that Education is value-laden we run the risk of ending up in Trivial Pursuit.

Educational philosophy is an ongoing process. It reoccurs especially in times when working life is undergoing changes due to technical development and/or economical crisis. In today's competitive global economy the in-word in educational thinking is **Knowledge Society**. But this term is a bit misleading since it seems to imply that there was no knowledge before. What has happened is rather that working life for a long period of time has become more and more **abstract**. We do not chop wood any longer to keep us warm in the winter, but we turn on a thermostat and suddenly our house is comfortably warm. But while we learnt to manipulate switches and dials we have forgotten which type of wood gives most heat per mass and less soot and ash. Thus one type of knowledge has been replaced with another. But to invent and manufacture an automatic energy control system (in the example above) requires knowledge highly abstract and specialized. We need to know the answers not only to the question How? but also the answer to the question What? Any society that wants to survive in the market economy will have to have a work force with considerable analytical and creative capabilities, not just people who know How.

Computerism

Given the context of these deliberations let me consider the possible impact on computers in education. This allows me to give an inverted twist to my arguments.

A gate to the Internet

The appearance of the computer has changed our lives, but not to the extent that some people like to think. It is questionable whether we have become more creative, more productive and

more communicative since we started using computers. We might still do the wrong things – but faster. From the Internet we might have access to more words and pictures, but this is of little value until we manage to interpret, evaluate and assimilate the **data** in order to turn it into **information** and eventually **knowledge** (and ultimately **wisdom**, one would hope). The increasing flow of information puts a strain on us in that we need to be able to judge the validity and reliability of what is often presented as facts. We have to be more critical than ever before. Helping the learners to develop this **critical thinking** is the real challenge to the educational system in the time of Internet. But the criticality can (or, may be should) spill over into other domains than Internet. Thus an education gear towards putting texts (and iconographic material) under critical scrutiny is inevitably going to have effects on students that might horrify many in society. Thus finding a balance between tradition and modernity is one of the major tasks of curriculum developers.

Summary 1. Today's students have to have a chance to learn to master the computer and the Internet. This entails manipulative skills, but more important, a mind trained in critical and constructive thinking.

Computers and Learning?

Computers have been hailed as the panacea to learning itself. This seems to follow a tendency sometimes called: *The Technological Imperative*, i.e. if something **can** be done, it **should** be done. It has even been argued that with the interactive multimedial use of hypertext, visualisation and animation the students do not have to leave their house any more in order to study, correspond with their teacher and sit for the exam. Such a view is built on a mixture of values and assumptions about learning that is naïve in that it 1° ignores the importance of the social setting for learning that the school offers, and 2° is built on an outdated educational psychology. There is in fact – to my knowledge – **no substantial empirical support in the literature for the benefit of the computer as a learning tool**. Computers are good at performing dreary, repetitive jobs, e.g. in statistics, not to figure out student's preconceptions and learning difficulties. Furthermore it has a taste of "the petrified remains of somebody else's pet project". Like the advice one gets in *The Lonely Planet Guide*: somebody has already been there, what is there left to discover?

Allow me another quote to summarize the arguments.

The second-handedness of the world of learning is the secret of its mediocrity

A.N. Whitehead, *The Aims of Education and Other Essays* 1932.

Summary 2. The use of computer as a learning tool is greatly overestimated. What the market has offered so far in terms of software is most often built on an outdated educational psychology. See below.

Computers for special needs – and at a distance

Computers have successfully been utilized by students with special needs. Dyslexic children, for example, need to practise over and over again with simple reading tasks and get them approve or disapprove. This is a tedious job, which can be delegated to a computer. This argument also applies to the exercises with vocabulary in languages, where multimedia on CD can be very useful.

In remote, sparsely populated areas computers can be used for distant education. A teacher is accessible via E-mail and she/he can direct the student to resources in books, on the Internet or on CD-discs.

Summary 3. Tailor-made application of computers for students with special needs can contribute to better learning.

Computers and measurement

Computers are sometimes used in the acquisition and reduction of experimental data. This has revolutionized scientific research. Even in a learning context there can be benefits from using a computer for measurement. But, again, only when the students have a fair chance to understand the basics of the arrangement. Let us not bereave the students of the sensory experiences, which are part and parcel of science.

Summary 4. Computers can be reliable workhorses in routine measurement.

How is knowledge constructed?

Education Psychology

Whereas educational philosophy deals with the question about **What** is knowledge? (Epistemology) and **What** is worth knowing? Educational psychology focuses on **How** children learn? Here are some brief conclusions from the literature.

Pre-conceptions

Research on student's pre-conceptions of the learning task has shown variations with a range unknown to most people, except possibly experienced, concerned teachers. There seems to be many pre-conceptions in the classroom as there are students. Some sort of individualisation in the classroom is consequently an imperative.

Creativity – divergent approach

It is likely that too formal a mode of instruction will foster compliance rather than **creativity**. If the latter (rather than the former) is desirable students need time to “mess around” on their own for some time. With a properly permissive guidance they will eventually find their own way to insight and thus gain ownership of the knowledge. This calls for a more **divergent approach** to learning. Some students are by nature divergent learners and thus in need of some management not to get lost. Others are convergent learners and have to be encouraged to look around for themselves rather than to expect to be given the right answer. Many educational thinkers have emphasised the need for a **holistic approach** to learning: when all senses are involved in the learning the result is more likely to be internalised by the student.

Knowledge constructed, not delivered

If we subscribe to the view on learning outlined above we have to stop using words like “deliver”, “provide”, “impart” and “convey” knowledge. Knowledge delivered, provided, imparted or conveyed does not build modernity. But knowledge constructed through a discourse in a non-threatening environment does. In essence this is nothing more than what Socrates practised. When faced with a question from his disciples he would return the question by asking: What do you think yourselves? (In other contexts the reply could have been: The Master says, or the book says: ...) Socrates shows respect for his students by

finding out their pre-conceptions and, while encouraging them to develop their arguments, he points out inconsistencies in their arguments until they together have reached some sort of consensus that could count as answer. It is not always possible to use Socrates method in today's classroom. — Yes, advocating Socrates' method is a value statement. But it is difficult to see how modernity with creative, self-critical entrepreneurs could be built in any other way.

Teachers' role

Viewing learning as outlined above calls upon the teachers to play a different and more demanding role, for which some external learning resources like books and computers are needed. But to merely provide these resources without having sufficiently many teachers knowing how to play the role of negotiator is a waste of money. Given that this (new) role of a teacher is exceedingly difficult and taxing, more investment should be spent on training, support and remuneration of teachers than on the purchase of computers that very quickly become technically obsolete. Furthermore, in the document from MoE, "e-learning", A Strategic Framework, it says that the Vision for the Future should be achieved by a "Shift of "Teaching" role to "Facilitator & Negotiator" of Learning". This is in agreement with the ideas developed in this paper **but** with the important difference that this shift, as I see it, is prompted not by "e-learning" but by insight into the learning process.

I have attempted to show that massive investments in computers as learning tools with the presently existing software, **without considering what in fact is known about the learning process, could be misleading**. As the history of education is full of failed "quick fixes" it seems as if the only thing we learn from history is that we do not learn from history. Is it time to change that before e-learning becomes a-learning?

Modes of learning

What modes of learning are most useful if it is true that we are learning best in a meaningful context? In other words: How do we create a meaningful learning environment in the school? Or: What does "meaning" mean to schoolchildren? (Pun intended). Here we have nothing else to rely upon than the fact that children naturally show great interest in various things. They want to learn. But schooling often takes them out of this habit, unless... In order to get some orderliness in the children's quest for learning we will have to help them to formulate relevant problems. Once the problem is formulated a number of new questions pop up and call for answers. The problem has thus become the base for learning. When applied to a school situation this approach is consequently called **Problem Based Learning, PBL**. It is important to point out that PBL is not an exercise in problem-solving per se. The function of the Problem is to be a "condensation nucleus" for learning.

Projects – Social skills

PBL is often run in projects in which a group of students work together. This gives the students control over and responsibility for their own learning. Although such an arrangement can be very advantageous it is also open to abuse. Free riders and cheaters can benefit unduly on other student's work. This calls for yet another role of the teacher, that of teamwork manager. Experience shows that the social conflicts in PBL are more difficult to handle than the intellectual ones. But what could be more important in this multicultural world than to learn to listen and respect other's point of view even if one does not agree?

Open discourse

By necessity PBL is an open discourse. All sorts of **sub-problems** can come up to the surface, problems that often do not belong to the traditional array of subjects. Examples are: Economics, environmental concern, legal affairs, human rights... The teachers will have to respond adequately to such concerns by suggesting sources of information outside the classroom. Properly managed such “offspring” activities can be very valuable.

Communication skills

Right through PBL students will have to talk and write about their questions as well as their findings. Communications skills thus come in naturally rather than as something extra.

Relevance and Rigour

PBL has been practised for a long time in tertiary medical and technical education. But it is also increasingly being applied to secondary and middle schools. Some critics coming from the traditional academic disciplines, e.g. mathematics, have claimed that students learning according to PBL will not develop enough depth and rigour. This might be true, but is outweighed by the likelihood that what the students have learnt in PBL is thoroughly integrated in their mind, because it was studied “just in time”. So, for example, when students run into trouble analysing answers to a questionnaire (as part of their project) they discover the necessity for statistics, and thus ask for resources to learn just that. This quest for relevant knowledge can spur students to good learning. To have learnt to appreciate the relevance of certain knowledge domain is as important as to be a technical virtuoso therein. Students need Relevance as well as Rigour.

Life long learning

PBL seems to be a good preparation for Life-long Learning. This highly desirable learning outcome is often being discussed only as a question of availability. But this is only a secondary problem. While building on the students’ natural inquisitiveness the school (as a primary task) must help their disciples to develop **problem sensitivity** and (as a secondary task) show them means to tackle the problem. This latter entails not only using libraries or computer based information systems but also conducting interviews and writing requests for information to public persons and organisations. Thus the students become self-propelling learners for life.

Empowerment

The underlying idea of PBL is that of empowerment of the students. But that does not mean that the teacher is left without power. She/he has new important roles to play; one of the most important being the selection of the Problem. In doing so even the teacher is empowered, *visa-vi* his superior. As a preparation for this new role it is suggested that teachers should be involved at an early stage of this educational reform, since this will give them ownership of what is to come.

Teachers who see themselves as custodians of an academic subject have sometimes difficulties to adjust to PBL. There are accounts in the literature of teachers who have had nervous breakdowns when no longer allowed to teach in the old authoritarian way. Ideally teachers should be given a choice whether or not to participate in PBL.

A tailor made system

PBL is seldom practise to 100%. Some traditional courses are often run in parallel with the ongoing projects. This allows for a tailor-made educational system.

The literature is full of positive accounts on successful PBL. As a matter of fact it “method” it right now seems to be the only one with some proven achievement. The only problem it creates is that of evaluation, examination and certification. Students and parents insist on getting confirmation from the school. Many ambitious a project has failed because of just that. But much thinking and experimentation has also been done about examination in PBL. After all, the ultimate test of the results from PBL is how students perform in real life. Even though the validity and reliability of such an evaluation is uncertain, there is some evidence that the social skills and the resourcefulness of former PBL students outweigh the possible blank spots in their subject matter knowledge.

Is PBL just another educational fad? Most likely: No. One reason being that it contains ideas tried out earlier in Montessori schools, at Summer Hill and in schools run by followers of Rudolf Steiner. PBL has also drawn from the ideas underpinning the Folk Development Colleges in Scandinavia.

Final words

*Education is not the filling of the pail
but the lighting of a fire*

W.B. Yeats

In reaction to Yeats, word we must ask ourselves: can computers light a fire?

Appendix 3

Three principles for organising a curriculum

A brief note

Any curriculum can be seen as a mixture of three components. The problem is that these components are mutually incompatible.

1. Socialization
2. Intellectual cultivation
3. Personal growth

Socialization is the oldest curriculum idea. Few would object that it is incumbent upon the school to initiate the young into knowledge, skills, values and commitment common to the adult members of the society. This is a way to maintain the stability of the society. Most societies are however not closed any longer; in fact the openness has gone to its extreme: globalisation. Socialization will thus on its own not be an adequate preparation for the future of the young

Intellectual cultivation is an idea that goes back to Plato's Academy. The advocature is here for an ability to reflect on ideas, to pull them this way and that until some bedrock of truth and certainty is established. Few would object to putting mathematics and some philosophy on the school curriculum. However, if this idea becomes too dominant it tends to make schooling elitist.

Personal growth is an idea connected to Rousseau, although Dewey takes up the idea and develops it. The goal for education is the students' development, rather than the acquisition of ideas or the perpetuation of society. It is also different in that the "means and ends of education are tied together". Education is a process of personal growth.

These fundamental principles are however incompatible. Plato e.g. emphasises the ideas, whereas Rousseau puts the learning subject first. Thus any blend of the three curriculum principles is likely to create disappointment among some stakeholders

Many attempts have been made to bridge the gaps between the three principles of curriculum. The call for authenticity in learning is one of them. This implies using ill-defined real life environment for, say, the study of energy. Making energy an issue of the survival of society (principle 1.) provides motivation for an in-depth analysis of the concept of energy (principle 2.) – If, while building on the students' preconceptions about a concept (principle 3.), the learning is organised to make the students recognise that knowledge objects can take on a life of their own and may be considered independently of their personal relevance (principle 2)

If the aim of Jordan is going to become a "Knowledge society" it seems that a move towards more of components 2 and 3 is unavoidable.

Appendix 4

Component 2

Transformation of the Education Programs and Practises to Achieve Learning Outcomes relevant to the Knowledge Industry

1. Preamble

In responds to the national call for skills and aptitudes to be attuned to the knowledge economy the Ministry of Education of Jordan has decided to make a major transformation of curricula, instructional modes and managerial practises in the schools.

What is often referred to as the Knowledge Economy is the fact that modern life, including the economy, has become increasingly aggressive and abstract. In order to be competitive on the world market countries just have to follow suit. In the case of Jordan many more creative entrepreneurs with well-cultivated intellectual minds are needed to challenge the market. This puts many demands on the educational system. Not only will young Jordanians have to be accustom to the latest information technology, but also, more important, be inquisitive, critical and self-propelling life long learners.

In educational reforms elsewhere an additional perspective is also applied: that of the pupil. Changes in family stability and in the vast increase in the range and power of the media has meant that young people face an environment which is rich in information and vicarious experience, poor in first hand experience, weaker than it ever was in emotional security and support. Thus the task of the school is far more complex than it used to be.

2. Frameworks

2.1 Curriculum Framework

A future curriculum as suggested above would have to be a new blend of Socialisation, Intellectual Cultivation, and Personal Development, which are the three pillars of any curriculum. If the curriculum work is going to be successful some sort of guidelines for the new blend will have to be established. It is thus suggested that the implementation of the proposed educational reform will start with a conference on desirable overall goals. This **conference** should – in order to make all operational actors part of the process – include all stakeholders. The expected outcome of the conference will be a ministerial decree to govern the future curriculum development. It is assumed that this framework will be the result not of nostalgia, hearsay and fear of the future, but built on hard evidence from the educational literature and – if necessary – complemented by research *in situ*.

2.2 Examination Framework

Examination is – whether we like it or no – the prime the factor shaping the students' perception of, and attitude towards their studies. It is thus of paramount importance that the examinations will reflect the learning outcomes as spelt out in the curriculum and dealt with in the learning material. But the examination system must also encourage the teachers to help students develop more complex skills, which are often un-testable in one go. However, prior to the curriculum work a decision has to be taken at ministerial level on the purpose, frequency and format of future examinations. In order to get maximum consensus about these value-laden issues it is recommended that early in the transformation process a **seminar** be convened to thrashed out questions like: Formative and/or summative testing; self-testing and

group-testing against externally set and marked pen-and-pencil tests; weighing different test results towards a final mark. Given the controversy over such issues it is also recommended that the proposed seminar is properly prepared and conducted by expertise familiar with the latest research.

3. Curriculum work

Once the curriculum framework is endorsed the work to write learning outcomes can commence.

3.1 Learning outcomes

A few words about the term “learning outcomes” since there seem to be some confusion on this issue. To spell out – in measurable terms – what the students are supposed to learn seems fair enough. But if this is done too rigorously it can turn into crude behaviourism. This is especially so in the domain of Personal Development although attempt has been made to formulate so called “performance indicator”. As all learning is contextual and intentional students tend to perform the way they think is best for the examination. And teachers are more or less forced to participate in this mutual corruption by drilling their students for exams. But if learning outcomes are treated as directions rather than end-goals these exam-oriented tendencies, can be kept at bay. This is particular important in the case of Personal Development where means and ends are identical.

3.2 Modes of Learning

”We don’t employ people as knowledge banks”. This quotation comes from research director in a large European enterprise. It continues: ”...so I want flexibility and continuous learning”. But flexibility and continuous learning cannot be taught in a vacuum. As discussed above such personal traits follow from flexible and self-governed learning; the means are the ends. This calls for new skills as critical thinking, ability to work in groups, willingness to take risks and make decisions, initiative and curiosity and a sense of service to the community. Thus learning outcomes should be supplemented by recommendations for possible modes of learning conducive to the expected outcomes.

3.3 Teachers involvement

All education is an exercise in collaborative parenting, in which the profession of teaching is seen as a complement to the vocation of parenthood. Teachers are therefore not in the first instance agents either of a national Curriculum Council (or whatever follows it) or of the state. They are bridges between individual children and the culture to which they belong. This culture consists partly of a heritage, which links them to the past, and partly of a range of skills and opportunities, which links them to the future. The role of the teachers is, in this respect, irreplaceable.

From what has been argued above it is paramount to involve the teachers to the extent that they feel that they themselves invented it all. That is why we suggest that 300 teachers should be identified and trained for three months by local and international expertise to participate in the construction of learning outcomes. They should ideally be selected on a regional basis, thus having their own “constituency” to report back to. It is also suggested that the future teacher-trainers should be recruited from this group.

3.4 Examiners involvement

Given the need for harmony between the curriculum and the assessment future examiners should be involved in the three months’ curriculum writing process, say, for one month. It is

suggested that the “examination trainees” will respond to early versions of the learning outcomes and the curriculum writers will learn from such a response.

3.5 Book producers involvement

The book printed on paper and bound together is still the supreme piece of educational technology. But if a book is prescribed as the Text it can have a stifling effect on learning. After all it is “the remains of someone else’s pet project”. If we believe that knowledge is constructed – not delivered, not taught, not conveyed – then a multitude of inputs are required to foster learning. But there are some advantages of having a textbook as a scaffolding for knowledge construction. Such a book should however challenge the students’ preconceptions about the world rather than perpetuate the established truth. Thus we prefer to talk about a “workbook”; and suggest that the production of such workbooks should be done on commercial terms. Should Jordan as a result of this suggestion manage to develop a schoolbook publishing industry the market will be huge.

However, publishers, writers and illustrators must be trained for workbook production. In this proposal there is a slot for training future publisher and their authors and illustrators. This could be part of the three months’ training for the curriculum writers and last of, say one month.

4. Implementation Phase

As the reform is supposed to be curriculum driven (rather than technology or management driven) the consequences of the new curriculum must be spelt out for classroom design, equipment including software and teacher training.

4.1 Classrooms

An open inquiry learning process requires many resources and a large degree of flexibility, partially because it is anticipated that more of inter-disciplinary activities will be conducted as a consequence of the new curriculum. Basically more area per student is needed, plus fixtures for water and drainage. These demands on the physical environment will have to be specified and handed over to those in charge of future school building.

4.2 Equipment

The furnishing of the classrooms will of course vary with the subject area. This has to be spelt out in detail once the curriculum is endorsed. For planning purpose an estimation of the costs has to be done before the curriculum is set.

4.3 Computer software and hardware

Computers should be considered as one of many resources. Thus, the computerisation must also be curriculum-driven. The first thing to do is to search for existing software. If something looks promising it should be tested in schools for learning benefits. Of special importance are the students’ views. Pros and cons must be systematically observed and recorded. Such an exercise is also useful for future software development. Once high quality software is available computers can be acquired.

Computers in the classroom with out computer-competent teachers are of little use. A special training programme for teachers must be undertaken. But preferably this should be done in context, for a purpose. The existing software is then the natural starting point. The training, which is suggested to take place under 4.6, can of course later be extended to more general computer handling skills, and certified by a diploma.

4.4 Workbooks

The choice of a producer for the schoolbooks should preferably be done through tender. This requires a tender document. That too will have to reflect the ideas in the curriculum. Once the tenders are submitted and one publisher awarded to job production can start.

4.5 Training Teacher Trainers

The importance of trained teachers cannot be overestimated especially when a reform is to be implemented. Experience shows that top-down management is likely to fail. Some teachers do not fully understand the underpinning ideas; others do understand, but still decide to procrastinate or even boycott the reform. A bottom-up reform is more likely to succeed. But is usually slow, since it takes time for new ideas to sink in and be turned into practise. And it takes time to accept the new responsibilities in a decentralised system. Highest possible participation at all stages and levels of the reform is thus essential. That is why the heavy representation of teachers in the curriculum work was suggested. It is now further suggested that once the curriculum work is over those 300 should be offered training as future teachers trainers. The advantages are obvious: their involvement in the curriculum development makes the custodian of the new ideas. But teacher training deals with adults, whereas schoolwork deals with children and youngsters. So this upgrading has to be done strictly professional. It is suggested that over a period of five months this training is conducted Open University style, i.e. with a mixture of reading assignments, videoconferences and weekend seminars. A team of local and international experts will have to be contracted for this crucial task.

4.6 Training teachers, "Supervisors" and Principals

The final step is the training of teachers, i.e. all teaches in the grades 1, 4 and 9 and their administrative support staff. Three months pre-service – still under the guidance of the expert team – followed by on-service project is suggested as the mode of operation.

4.7 Monitoring and Assessment

Built on the framework developed under 2.1 above examiners will have to be trained in the new double role as: 1. Providers of formative testing material to the teachers (should that be decided) and 2. Constructors and administrators of summative tests. It is assumed that before the teacher training begins the examiners will have produced enough adequate samples.

Timesheet

<i>Subcomponent</i>	<i>Activity/Input</i>	<i>Outcome/Indicator</i>	<i>Timeframe mm/yy-mm/yy</i>	<i>Responsibility</i>
Component 2: Transform education programs and practices to achieve learning outcomes relevant to the knowledge economy				
2.1 Erect educational frameworks	2.1.1 — Curriculum framework: call a conference lead by international expertise to interpret the plea for “knowledge economy”-skills in terms of curriculum theory.	A guiding document laying down the basic values in terms of the educational philosophy for the educational reform.	June 03	MoE with consultants
	2.1.2 — Assessment framework: Conduct a seminar lead by international expertise to decide on the frequency, purpose and format of future school assessment.	Steering document on assessments and examinations	June 03	MoE with consultants
2.2 Write curriculum including desired learning outcomes	2.2.1 — Identify, on a regional bases and with substantial say from the teachers themselves, in total 300 teachers from all school subjects to become future curriculum writers. Supplemented with ministry personal with adequate background.	300 teachers	June 03	School districts and MoE
	2.2.2 — An international team will train the 300 teachers for 3 months in curriculum studies, arrange study tours to non-traditional schools in Jordan and visits by leading experts on non-traditional teaching such as Problem Based Learning, Frenet and Steiner inspired learning.		July – Sept 03	Consultants
	2.2.3 — The participants will produce draft curricula including learning outcomes (for the use in 2.3 and 2.4)	First version of a curricula	Aug 03	Participants, Consultants
	2.2.4 — The final curriculum is written for all grades and all knowledge domains.	Complete set of learning outcomes — Suggestions on various ways of achieving the learning outcomes.	Sep 03	Participants, Consultants, MoE
2.3 Involve examiners	A group responsible for examinations will on a part time basis join the ongoing training (2.2.2) on writing and examining learning outcomes.	Sample examination items for assessing learning outcomes.	Sep 03	Moe
2.4 Involve workbook writers	As a joint venture with the private sector selected workbook writers will on a part time basis join the ongoing training under (2.2.2)	Preliminary sketches for workbooks.	Sep 03	Moe
2.5 Preparation for the implementation of the new curriculum	2.5.1 — Specify what the new curriculum demands in terms of physical environment	Specifications to be handed over to the agency responsible for the school buildings.	Oct 03 –	MoE and Procurement

	2.5.2 — Specify the need for equipment in all knowledge domains as driven by the new curriculum.	Equipment lists.	Oct 03 –	MoE and Procurement
	2.5.3.1 — Search for and test existing educational software.	Purchase of software. Recommendations for the development of future software	Oct 03 –	ELCM
	2.5.3.2 — Decide on production of additional educational software.			ELCM
	2.5.3.3 — Recommendations – qualitatively and quantitatively – on the purchase of computer hardware.			ELCM
	2.5.4. — Produce a tender document for the production of workbooks as demanded by the curriculum	Tender document sent out. Tenders checked and awarded		MoE
	2.5.5 — Produce workbooks for grade 1, 5 and 9	Workbooks	Jun 04	Publisher
2.6 Train Teacher Trainers	The selected (under 2.2.1) are being offered training to train teachers for the new curriculum. (Including the use of ICT) This is done in the Open University style: readings, assignments, videoconferences, and weekend seminars...		Jan – May 04	Consultants + MoE
2.7 Train Teacher	Teachers in grades 1, 5 and 9, principals and supervisors are trained to organise learning according to the new curriculum	Teacher professional	July – Aug 04	MoE and Specially trained trainers
2.8 Train Examiners	2.8.1 — Training of examiners on how to produce school based and well as national formative and summative assessments		Oct 03 –	Consultants and MoE
	2.8.2 — Specification and purchase of computers and OMR.			Procurement
	2.8.3 — Production of formative test items	First item bank – formative for grades 1, 5 and 9	Aug 04	Examination body
	2.8.4 — Production of summative test items	First item bank – summative for grades 1, 5 and 9	May 05	Examination body

Timesheet Component

Suggested Timetable for the Creation and Implementation of the New Curriculum

2003				2004											
June	July	Aug	Sept	Oct	Nov	Dec	Jan	Febr	Mar	Apr	May	June	July	Aug	
Ministerial decree to be issued as a steering document	Conference on examination policies	Curriculum Work			Training Teacher Trainers						Training Teachers, Principals and Supervisors				
		Examiners trained	Bookworkers trained	Classroom spec.											
				Equipment spec.											
				Software search			Additional software specified and commissioned								
				Computers ordered			Computer training for teachers								
				Tender process			Workbooks to be produced								
				Training to develop examination procedures						Develop item bank					